

THIS OPINION WAS NOT WRITTEN FOR PUBLICATION

The opinion in support of the decision being entered today (1) was not written for publication in a law journal and (2) is not binding precedent of the Board.

Paper No. 26

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ROBERT C. BURNS and DENNIS L. WELCH

Appeal No. 96-1145
Application 08/203,768¹

ON BRIEF

Before WARREN, OWENS and KRATZ, *Administrative Patent Judges*.

OWENS, *Administrative Patent Judge*.

DECISION ON APPEAL

¹ Application for patent filed March 1, 1994. According to the appellants, the application is a continuation of Application 07/911,895, filed July 10, 1992, now abandoned.

This is an appeal from the examiner's final rejection of claims 13-26. Claims 1-11, which are the only other claims

remaining in the application, stand withdrawn from consideration

by the examiner as being directed toward a nonelected invention.

THE INVENTION

Appellants' claimed invention is directed toward a method for producing diamond crystals on seed particles which are separated from a carbon source by a plurality of alternating zones of carbon-rich and carbon-lean metallic solvent extending from the carbon source to the seed particles.²

Claim 26 is illustrative and reads as follows:

26. A method of producing diamond crystals which includes the steps of placing a reaction vessel in the reaction zone of a high temperature/high pressure apparatus, wherein said reaction vessel includes a reaction volume and a

² Appellants state that the carbon-rich zones typically contain about 3.5-5 wt% carbon, and the carbon-lean zones typically contain substantially no carbon, i.e., less than 400 ppm carbon, and that the carbon may be dissolved in the metallic solvent or admixed therewith (specification, page 4).

reaction mass located in the volume, the reaction mass comprising a plurality of seed crystals located in or on a surface and a carbon source separated from the seed particles by a mass of metallic solvent for diamond synthesis, the mass comprising a plurality of alternating zones of carbon-rich and carbon-lean metallic solvent extending from the carbon source to the seed particles,

and subjecting the reaction mass to conditions of temperature and pressure in the diamond stable region of the carbon phase diagram such that a temperature gradient is created between the seed particles and the carbon source with the seed particles being located at a point approaching the lowest value of temperature for the temperature gradient and the carbon source being located at a point approaching the highest value of temperature for the temperature gradient and maintaining these conditions for a time sufficient to produce diamond crystals on the seed particles.

THE REFERENCES

Yazu et al. (Yazu)	4,632,817	Dec. 30, 1986
Tsuji	4,927,619	May 22, 1990
Yoshida et al. (Yoshida)	5,273,730	Dec. 28, 1993
	(effective filing date Mar. 3,	
1989)		

THE REJECTIONS

The claims stand rejected as follows: claims 13, 16, 20, 22 and 26 under 35 U.S.C. § 102(b) as being anticipated by Yazu; claims 13, 16, 18-22 and 24-26 under 35 U.S.C. § 103 as being obvious over Yazu; claims 14, 15, 17 and 23 under 35 U.S.C.

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§ 103 as being obvious over Yazu in view of Tsuji and Yoshida; and claims 13-26 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as the invention.

OPINION

We have carefully considered all of the arguments advanced by appellants and the examiner and agree with appellants that the aforementioned rejections are not well founded. Accordingly, we do not sustain these rejections.

Yazu discloses a method for producing diamond crystals in a synthesizing vessel (10) which is divided by a partition layer (16) into a pair of synthesizing chambers (10a) and (10b), one

above the other (col. 4, lines 63-66; col. 5, lines 20-23). Each synthesizing chamber contains, in order in the downward direction, a carbon source (12a or 12b), a solvent metal layer (13a or 13b), and seed crystals (11a or 11b) (col. 5, lines 13-17). The partition layer is made of a material which is

not reactive to the solvent metal, such as oxides, halides, minerals, carbides or nitrides (col. 7, lines 32-41).

Diamonds are formed

in each synthesizing chamber under diamond-stable superhigh temperature and pressure, and during diamond formation, there is a temperature gradient across each solvent metal such that each carbon source is in contact with the highest-temperature portion of the respective solvent metal and the seed crystals are in contact with the lowest-temperature portion of the respective solvent metal (col. 3, lines 53-64).

The examiner argues that in Yazu's method, "the portion of the metal encompassing the seed is carbon-rich, the center is carbon-lean and the portion touching the carbon source has carbon dissolved therein" (answer, page 3). This argument is not persuasive even if it is correct, because appellants' claim 26, which is the only independent claim, requires "a plurality of alternating zones of carbon-rich and carbon-lean metallic solvent extending from the carbon source to the seed particles". The examiner does not explain, and we do not find, where Yazu

discloses at least two carbon-rich zone/carbon-lean zone combinations extending from a carbon source to the seed particles.

The examiner argues that "[w]ith regard to Yazu, the reference will at the very least generate in-situ the claimed alternating layers during heating but before diamond formation, which meets the claimed limitations" (answer, page 6). This argument is not well taken because, first, the examiner does not explain, and it is not apparent, why a plurality of alternating zones of carbon-rich and carbon-lean metallic solvent are generated in-situ in Yazu's method. Second, the examiner's argument is directed toward the time before diamond formation, whereas appellants' only independent claim (26) requires that the conditions be maintained for a time sufficient to produce diamond crystals on the seed particles.

The examiner argues that the Yazu's stacked cells meet the plurality of zones requirement of appellants' claims (answer, page 6). This argument is not convincing because Yazu's synthesizing vessel is separated into separate synthesizing chambers by partitions (col. 4, lines 64-66; Fig.

3). Even when appellants' claims are given their broadest reasonable

interpretation, *see In re Morris*, 127 F.3d 1048, 1055, 44 USPQ2d 1023, 1028 (Fed. Cir. 1997); *In re Zletz*, 893 F.2d 319, 321, 13 USPQ2d 1320, 1322 (Fed. Cir. 1989), they clearly do not encompass a method in which the plurality of alternating zones exists only between a carbon source in one synthesis chamber and seed particles in a separate synthesis chamber.

For the above reasons, we find that the examiner has not carried his burden of establishing a *prima facie* case of anticipation of the method recited in any of appellants' claims 13, 16, 20, 22 or 26. We therefore reverse the rejection of these claims under 35 U.S.C. § 102(b).

In the rejections under 35 U.S.C. § 103, the examiner addresses only limitations in the dependent claims (answer, pages 3-5). The examiner does not explain, and it is not apparent, why Yazu, alone or in combination with the other applied references, would have fairly suggested, to one of

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ordinary skill in the art, use of a plurality of alternating zones of carbon-rich and carbon-lean metallic solvent extending from the carbon source to the seed particles as recited in appellants' only independent claim (26). Accordingly, we reverse the rejections of claims 13-26 under 35 U.S.C. § 103.

As for the rejection under 35 U.S.C. § 112, second paragraph, the relevant inquiry is whether the claim language, as it would have been interpreted by one of ordinary skill in the art in light of appellants' specification and the prior art, sets out and circumscribes a particular area with a reasonable degree of precision and particularity. *See In re Moore*, 439 F.2d 1232, 1235, 169 USPQ 236, 238 (CCPA 1971). As with any ground of rejection, the examiner bears the initial burden of establishing a *prima facie* case of unpatentability. *See In re Oetiker*, 977 F.2d 1443, 1445, 24 USPQ2d 1443, 1444 (Fed.

Cir. 1992). The examiner argues that "[i]n claim 26, 'for the temperature gradient' is unclear since the gradient is only a mathematical construct and the phrase appears unnecessary" (answer, page 3). The examiner also argues that "temperature gradient" itself is unclear (answer, page 5).

The examiner's arguments are not persuasive because the examiner has not carried his initial burden of providing evidence or sound technical reasoning which shows that due to the presence of the phrase, "for the temperature gradient", appellants' claim 26 would not have set out and circumscribed a particular area with a reasonable degree of precision and particularity to one of ordinary skill in the art who interpreted the claim in view of appellants' specification and the prior art. Consequently, we do not sustain the rejection of claims 13-26 under 35 U.S.C. § 112, second paragraph.

DECISION

The rejections of claims 13, 16, 20, 22 and 26 under 35 U.S.C. § 102(b) as being anticipated by Yazu, claims 13, 16, 18-22 and 24-26 under 35 U.S.C. § 103 as being obvious over

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Yazu, claims 14, 15, 17 and 23 under 35 U.S.C. § 103 as being obvious over Yazu in view of Tsuji and Yoshida, and claims 13-26 under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which appellants regard as the invention, are reversed.

REVERSED

CHARLES F. WARREN)	
Administrative Patent Judge)	
)	
)	
)	BOARD OF PATENT
TERRY J. OWENS))
Administrative Patent Judge)	APPEALS AND
)	
)	INTERFERENCES
)	
PETER F. KRATZ))
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